



Poul Erik Andersen
CIRSE 2008 Meeting Chairman

Dear Colleagues,

CIRSE continues to grow and our annual meeting is getting more and more successful. The CIRSE congresses have become Europe's most comprehensive and innovative interventional meetings. If we wish to attract attention to Cardiovascular and Interventional Radiology, congresses like ours can function as catalysts, as they give us opportunity to attract public awareness and political attention, thus helping to shed the idea that Interventional Radiology is a medical secret.

The scientific content of the CIRSE meetings is constantly improving thanks to the excellent academic work of the members of our society. It is the ambition of the CIRSE 2008 Local Organising Committee to contribute to this positive development in growth and quality. I am confident that the Scientific Programme Committee will prepare another outstanding programme. Of course we are hoping for a new record in the number of participants, as well as in the number and quality of submitted oral presentations and EPOS posters. We also hope that our partners from the industry will continue their generous support next year, as a good relationship between the industry and Interventional Radiology is crucial for the development of new technology. CIRSE 2008 will be the first CIRSE meeting in Denmark and with its expected 5,000 attendants it will be the biggest radiological congress ever to be held in Denmark. Apart from the excellent educational content, I am also looking forward to the social events to take place in Copenhagen. These informal gatherings provide an excellent opportunity to strengthen the bonds that unite our countries and make contacts and friends with colleagues from around the globe.

Our 2008 venue will be the Bella Centre, Scandinavia's biggest conference centre with a capacity of up to 20,000 people. It will provide the perfect setting for doctors, researchers, students, trainees, and company representatives to meet and exchange opinions.

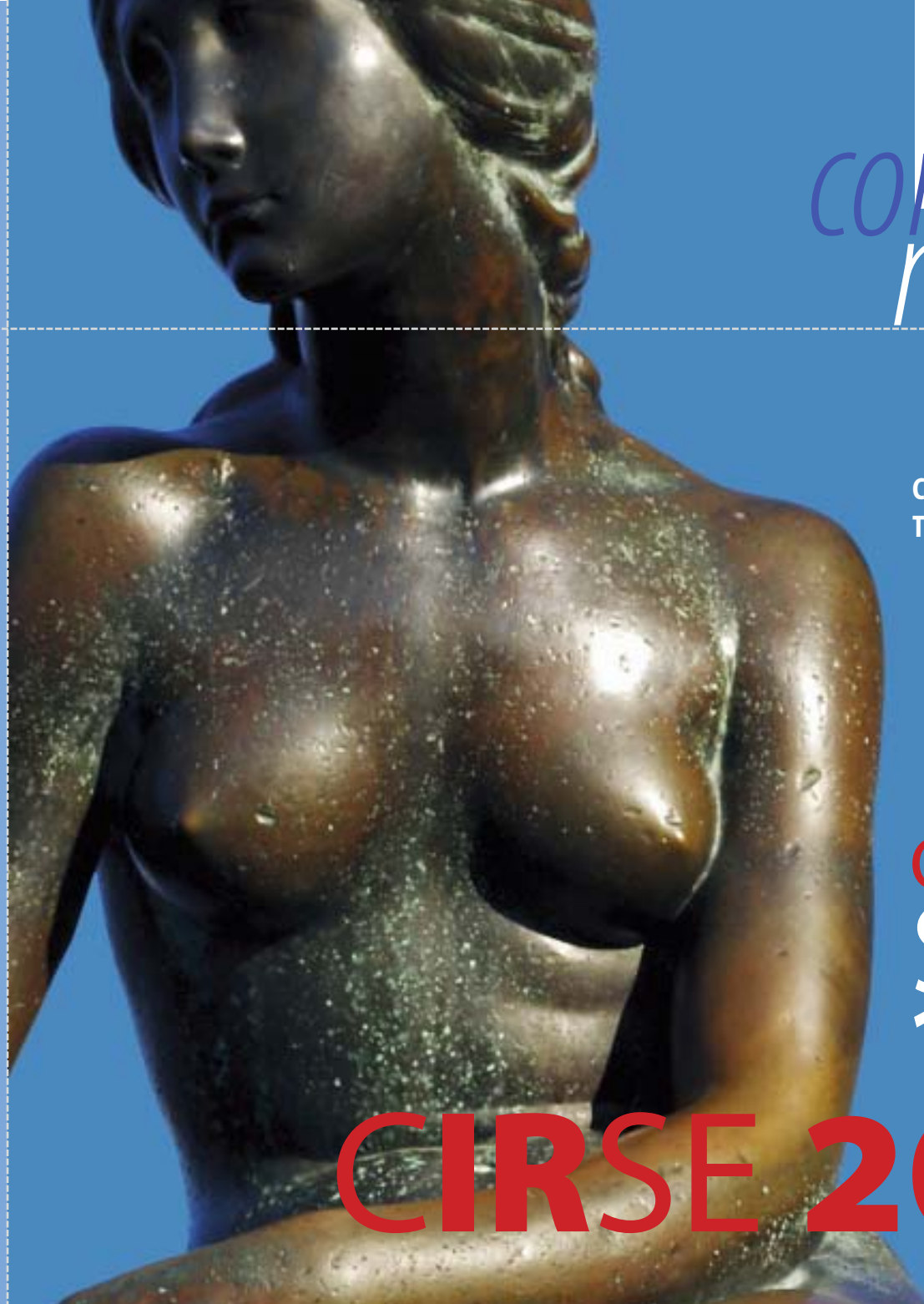
Copenhagen offers a beautiful backdrop for CIRSE 2008. Since 1995 it has been ranked as one of the top ten cities for international congresses. Copenhagen Airport is the major hub for air traffic in Northern Europe and can be reached directly from most international airports. Copenhagen is easy to arrive at and to move about in. The Bella Centre has its own metro station only 10 min. from the city centre. Most facilities and sight-seeing down-town are within walking distance. There are more than 13,000 hotel rooms and a large selection of sight-seeing destinations and shopping in and around the city.

You will find that Copenhageners are very friendly people, giving the city a special atmosphere. It is a city full of zest and life – a pulsating metropolis and historical oasis. Although Copenhagen is a large city with over one million inhabitants, it is also very green and its seaside location gives it a special maritime touch.

I am happy to inform you that the preparations for CIRSE 2008 are proceeding well. Many people are working hard behind the scenes and contributing to this venture with great energy. I would like to take this opportunity to thank the enthusiastic and visionary team in the Vienna office, lead by Daniel Waigl, for their help in preparing the annual meeting in Copenhagen.

I very much look forward to welcoming you to Copenhagen and hope that you will spend an unforgettable time there!

Poul Erik Andersen
Meeting Chairman CIRSE 2008



IR
congress
news

CIRSE 2007 - Athens
Tuesday, September 11, 2007

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13-17
CIRSE 2008



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As the incoming CIRSE president I feel very proud and honoured that I am able to represent and work for Interventional Radiology across Europe. I would like to leverage the many positive steps that have been taken during the last years, which started with the establishment of our own CIRSE office and staff in Vienna. This dynamic team very much expands our options to initiate new projects, such as the European School of Interventional Radiology (ESIR) which has already proved to be very successful.

For my term I am planning to pursue 4 macro goals in order to develop our society. I intend

- to expand membership,
- Introduce new educational tools,
- Co-operate outside of Europe and
- Initiate several outreach programmes.

Reaching out to new members

The scope of our membership services has increased substantially in the last two years. The number of CIRSE members has also grown by more than 30%, leaving the 2,000 member benchmark far behind. CIRSE now has 11 affiliated national societies and many more

CIRSE in the next two years – a vision from the incoming president

interested in joining us. As president it will be one of my top priorities to expand our initiatives aimed at enlarging our society and further improving the benefits membership brings.

Expanded training and education

Providing training and further education in IR, one of CIRSE's main strategic goals, will be at the top of my agenda. I will diligently work to further expand our educational programme by introducing additional foundation courses, e-learning and hands-on workshops held under the auspices of CIRSE in various institutes throughout Europe.

Another initiative in IR education will be the establishment of a European curriculum for Interventional Radiology. In line with this project we have applied for IR to be recognized as a subdiscipline of the UEMS, although we want to remain under the umbrella of the radiology UEMS section.

Finally all of these activities should culminate in a European Board examination for IR. It is my objective to see this project to a successful conclusion during my term in office. If I will not be able to finish this certainly ambitious initiative, I certainly will do my best to get it on track.

Looking beyond Europe

I am committed to expanding our reach beyond Europe with the development of a global strategic plan for IR. This could be especially useful for countries in which IR is still in the early stages of development. I am also planning to stimulate cooperation between CIRSE and national societies to our mutual

benefit. I am looking especially to Asia, including China in particular, as IR is a very rapidly developing specialty in these countries. CIRSE can help, support and offer advice through IR task forces, an "A-Team for IR", so to speak. I strongly believe that IR is a profession facing the same problems and challenges all over the world.

Our impact within and beyond IR

Finally I am planning several projects which are very close to my heart. It is my vision to drive towards making CIRSE the first "green" medical society in Europe by offering a programme to neutralise the carbon footprint of participants of our annual meetings. I will also look into what CIRSE can do to support African doctors locally. Last but not least I will try to find a way for CIRSE to mediate or tender European research projects in cooperation with the industry. I strongly believe that the future of IR depends on proving and promoting the benefits of what we do every day. We must back our cause with solid scientific evidence to secure the financial support of the insurance companies.

I realise that these are ambitious plans for a term that only lasts 2 years. Nevertheless I hope that with your help I will be able to implement these visions and initiate others for my successor to complete.

I know that the success of my presidency will largely depend on your support, which is why I look forward to your ideas and suggestions on how we can continue making CIRSE the home and voice of IR in Europe.



For 44 years, Cook Medical has supported cardiovascular and interventional medicine through its innovative, high quality products. We continue our support through a full range of learning experiences from experts in your field. Please join us in the Cook Learning Centre at booth #16 for the following:

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Saturday, September 8	13:00 - 13:30	Challenges of Renal Stenting <i>Jörg Tessarek, M.D. Ph.D., University of Münster, Germany</i>
	14:30 - 15:00	The Advantages of Using a Micropuncture Technique in Biliary Interventions. <i>Hans van Overhagen, M.D. Ph.D., Haga Ziekenhuis, Den Haag, NL</i>
Sunday, September 9	11:15 - 11:45	Embolization Techniques for Large Vessel Occlusion <i>Anthony Nicholson, M.D. Ph.D., Leeds Univ., UK</i>
	13:00 - 13:30	Expanding AAA Indications with Branch Technology <i>Clare Cousins, M.D., Addenbrooke's Hospital, Cambridge, UK</i>
Monday, September 10	11:15 - 11:45	Anchor and Scaffold Techniques in Coil Embolization. <i>Robert I. White Jr., M.D. Ph.D., Yale Univ. U.S.</i> <i>Nicola Burdi, M.D., SS Annunziata Hospital, Taranto, Italy</i>
	13:00 - 14:00	Cook Satellite Symposium (Trianti Hall) Endovascular Debates: Bare metal vs. drug-eluting stents in the SFA and expanding the use of retrievable VCFs. <i>Marc Sapoval, M.D. Ph.D., Georges Pompidou European Hospital, Paris, France</i>
	14:30 - 15:00	Vertebroplasty and Cementoplasty: What's new in 2007? <i>Jacques Chiras, M.D. Ph.D., La Salpetriere Hospital, Paris, France</i>
Tuesday, September 11	11:15 - 11:45	Coil Embolization: Macro, Micro & Detachable Coils. What to use when in different peripheral anatomical territories and indications. <i>Jean-Pierre Polage, M.D. Ph.D., Ambroise Paré University, Boulogne, France</i>
	13:00 - 13:30	Results of Self-Expanding Stents in Venous Applications <i>Sam Heye, M.D., University of Leuven, Belgium</i>

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Colorectal cancer is the third most common form of cancer and the second leading cause of cancer-related death in the Western world. Colorectal cancer causes 655,000 deaths worldwide per year (1). Between 35% and 45% of these patients will develop liver metastases during the follow-up, being diagnosed synchronous to colorectal primary in 15% to 25% of the cases.

In recent years the treatment of liver metastases of colorectal cancer has evolved from nihilism to the most aggressive approach nowadays. During more than forty years patients with stage IV colorectal cancer were allocated to best supportive care or to 5FU-based chemotherapy with palliative intention and near-zero long-term survival. Despite variations in the way of administration and modulation with leucovorin (folic acid), overall survival was around one year. In the late nineties the new effective chemotherapeutic agents such as oxaliplatin and irinotecan were advocated for advanced disease providing a significant increase in overall survival and objective response (2-4). With a combination of these agents and 5-FU sequentially overall survival reached a top of 20 months (5), but even with new targeted therapies with monoclonal antibodies, bevacizumab and cetuximab, a significant five-year survival is hard to achieve (6).

Nevertheless this improvement in chemotherapy results let irresectability criteria change in the last years and classical contraindications as the presence of four or more nodules, extrahepatic disease, synchronicity or hilar node involvement have been discarded. At present the only two premises required to planning a therapy with curative intention are assessing R0 resection leaving enough functional mass to assure liver function (7).

Controversies in oncologic IR - Pro: Resection is best for limited metastatic colorectal disease to the liver

This oncological and surgical evolution has been paralleled by the development of more precise image devices (MRI, multidetector scan, PET-scan), which let us detect as many lesions as possible before planning the treatment. But even in these cases, additional lesions, hepatic and extrahepatic, are discovered during laparotomy, being more frequent after neoadjuvant chemotherapeutic treatment (8). Analysing the outcomes in 45 patients evaluated preoperatively with triphasic dynamic multidetector-CT, after neoadjuvant chemotherapeutic treatment in 65% of the cases we found additional lesions in 11% per cent of the patients by means of bimanual palpation and intraoperative ultrasound, which meant irresectability in three patients (article in press).

This disparity between preoperative findings is becoming an actual situation hepatic surgeons must deal with given the capability of novel chemotherapeutic regimes to make lesions disappear. Nevertheless a complete radiological response does no longer mean pathological resolution, as we have been learning in several studies after neoadjuvant treatment and ongoing resection with almost 80% of lesions with radiological disappearance showing viable neoplastic cells, in other words, a relapse after cessation of chemotherapy (9).

In the setting of unresectable metastatic patients the idea of destroying the neoplastic deposits had obtained the development of several ablation techniques such as cryotherapy, microwave ablation and radiofrequency ablation with very heterogeneous results in terms of efficacy and local relapse, and with unfortunately no large published series with long monitoring.

Ablative techniques success assessment is not clearly defined and most groups base this response in the early post-procedure TAC or magnetic resonance and then after one and three or six months. Criteria for complete response at one month are to assess a hypoattenuated area greater than the previous tumour, which must disappear after the three

months evaluation and any hyperattenuated nodule in the area of parenchymal destruction. This "safety margin" is very difficult to achieve in large lesions, i.e. greater than 3 centimetres, in spite of new devices and adjuvant procedures (portal clamping, biliary cooling ...) and local relapse is elevated (10-12).

The brochure-based overoptimistic expectations of a perfectly spherical coagulation zone with a constant diameter is now ruled out based on more realistic experimental in vivo and ex vivo studies with a myriad of shapes in relation to the device used and the proximity of vessels or the surface of the liver (13,14).

Surgery is the only treatment that has achieved long term survival as we can see in several large series around the world with long follow-up, regardless of the presence of bad prognosis criteria (15-18). Assessment of success in hepatic resection is not a major challenge, as it is made by the surgeon in the field and in case of compromise permits enlargement of the margin to assure R0 procedure.

In the field of ablation techniques radiofrequency has emerged as the most promising one. Radiofrequency ablation is now becoming an alternative to resection for several visceral lesions, mainly in the liver, and some authors are claiming for randomized trials in resectable patients. Nevertheless the idealistic scenario of limited and small liver lesions is far from the current activity of a hepatobiliary unit with a number of patients with multiple, bilateral and vascular ill-located lesions.

In my opinion the absence of evidence for the oncological benefit of ablation procedures together with the impossibility of assessing the R0 results in the early post-procedure setting and the possibility of the understaging, mainly in the percutaneous approach, preclude the utilization of radiofrequency in resectable patients.

Don't miss it!

Controversies in oncologic IR Special Session SS 2803

Wednesday, September 12, 8:30-9:30
Room B (Mitropoulos Hall)

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Liver metastases from colorectal carcinoma (CRC) are the leading cause of cancer related morbidity and mortality in the western world. Approximately 20% of patients with CRC simultaneously suffer from liver metastases and 60% of patients develop metastases in the course of the disease. Thus, early and efficient treatment of metastases is indispensable. Surgical resection, which is possible in up to 25% of all cases, is rated as the gold standard therapy for colorectal metastases. In optimum conditions, the 5-year survival rate of this small group is 26 to 51%.

Depending on the tumour location, even small metastases may enforce resection of up to 50% of liver parenchyma, which may be necessary.

Controversies in oncologic IR - Con: Is resection best for limited metastatic colorectal disease to the liver?

Moreover, the rate of metastatic recurrence is over 50% within 3 years and perioperative morbidity and mortality increases significantly in repetitive surgery. This can be taken as a rationale for the "test-of-time" management of potentially resectable lesions (1). In a cohort of 88 patients with 134 resectable metastases who underwent RF ablation, 30 percent of patients with complete ablation remained tumour free whereas 70% developed new metastases. This strategy may hinder unnecessary surgical resections by distinguishing patients with good prognosis from those with aggressive tumour growths.

Radiofrequency ablation, which is the most common thermal ablation technique, was introduced into clinical routine in the late 80ies and proved to be a safe and efficient therapeutic option. As it is a non resective treatment, it can be repeated several times in case of new or relapsing lesions. Best candidates for RF ablation have no more than 5 lesions and no extra

hepatic disease (2). Powerful RF generators and latest probe designs as well as nearly 15 years of experience enable safe and complete tumour control when tumours to be treated do not exceed 3.5 cm in diameter. In several studies it was shown that tumours <2.5cm in diameter can be ablated in over 90%, tumours between 2.5 cm and 3.5 cm in 70% to 90%, and tumours between 3.5 cm and 5 cm in up to 50% of cases (3).

Under excellent imaging conditions, both percutaneous as well as laparoscopic RF ablation may yield 5-year survival rates of 30 to 41% in cohorts of 70 to 100 patients in single centre studies from several European countries (4, 5). The low local recurrence rate (0 to 2% in lesions below 3 cm in diameter) (6) challenges the results obtained by resective treatment like conventional surgery.

Although prospective randomized comparative multi-centre studies are still lacking, latest

results show the potential of minimally invasive thermal ablation which do not hinder additional anti-tumour treatment like modern systemic chemotherapy. Thus, it seems to be the time for a more aggressive interventional treatment strategy in patients with limited metastatic colorectal disease. We should not get tired of pointing out again and again that RF ablation is an effective, minimally invasive therapy, particularly in small-sized colorectal liver metastases with very promising long-term survival.

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Don't miss it!

Cardiac Imaging
Special Session SS 2801
Wednesday, September 12, 8:30-9:30
Room E



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CT coronary angiography

Over the last decade multi-detector-row computed tomography (MDCT) has continued its rapid technological development and has been established as a non-invasive imaging method of the heart. With the introduction of 40- and 64-slice scanners and gantry rotation times down to 330 ms, both spatial and temporal resolution have improved allowing for detailed analysis of the rapidly moving coronary arteries (1-4). With the introduction of dual-source CT-scanning temporal resolution has improved even further down to 42-83 msec (5) (Fig.1).

When performing cardiac CT, proper patient selection and patient preparation are key-issues in order to achieve satisfying results. Sinus rhythm is desirable and contraindications for iodine contrast media like renal insufficiency and hyperthyroidism need to be respected. Administration of oral or I.V. Beta-blockers has to be considered in patients with heart rates above 80 bpm, knowledge of contra-indications and potential side-effects being crucial. ECG-synchronization is essential in cardiac MDCT and retrospective ECG gating has been established for state of the art contrast-enhanced scanning. However, pitfalls in ECG-lead placement and strategies for better ECG signal acquisition always need to be considered.

For data acquisition several parameters like the detector collimation, the (heart rate dependent) pitch or different means of radiation dose reduction can be modified. Radiation dose reduction in cardiac CT-scanning may be achieved following different strategies. Depending on the patient's body weight or body-mass index the tube current can be adapted (6). Some vendors implement tools for attenuation based dose adaptation with the corresponding tube current value being chosen based on the attenuation of the scanogram.

For non-enhanced scans a dose reduction of up to 31.1% could be achieved (7). Secondly ECG-dependent tube current modulation offers the possibility for considerable patient dose reduction (8). Sinus rhythm is mandatory for

Table 1: Cumulative patient- and segment-based analysis of 64-slice MDCT studies (n> 30 patients) comparing coronary CT-angiography to invasive coronary angiography							
author / year		patients / segments	sensitivity (%)	specificity (%)	PPV (%)	NPV (%)	excluded (%)
Leschka 05 (11)		67 / 1005 ¹	94	97	97	99	0
Leber 05 (2)		59 / 885 ¹	77	97	85	95	10
Mollet 05 (12)	segment	885 ²	99	95	76	99	18
	patient	52	100	92	97	100	2
Raff 05 (13)	segment	1050 ¹	86	95	66	98	12
	patient	70	91	92	80	97	0
Ehara 06 (14)	segment	966 ³	90	94	89	95	8
	patient	69	98	86	98	86	3
Nikolaou 06 (15)	segment	1080 ¹	82	94	68	97	14
	patient	72	97	79	86	96	4
Mühlenbruch 07 (4)	segment	765 ¹	87	95	75	98	5
	patient	51	98	50	94	75	0
Pugliese 06 (16)	segment	595 ²	99	96	78	99	16
	patient	35	100	90	96	100	0
Ropers 06 (1)	segment	1124 ²	93	97	56	100	4
	patient	84	96	91	83	98	4
Ghostine 06 (18)	segment	990 ¹	72	99	91	97	0
	patient	66	97	95	93	97	0
Total	segment	9345	87,9	95,5	78,1	97,7	8,7
	patient	625	97,1	84,4	90,9	93,6	1,6

this technique and depending on the patient's heart rate the radiation exposure can be reduced by 28% to 48%. With the latest generation of CT-scanners the pitch can also be adapted to the patient's heart rate with higher pitch values for higher heart rates (5). In comparison to phantom measurements calculation programs for estimation of radiation exposure proved to be useful and reliable (9).

Applying retrospective ECG gating a continuous spiral CT scan with simultaneous ECG tracing results in a 4D dataset; after completion of the scan, image reconstruction with respect to the stored ECG signal is performed. As the anatomic structures of the heart are continuously imaged over the whole cardiac cycle, a substantially reduced pitch factor (table feed/total collimation) is mandatory. In return however, images at every phase of the cardiac cycle can be reconstructed from the acquired 4D dataset.

Of course optimum vessel lumen attenuation is a major prerequisite for optimum image quality and diagnostic value of cardiac MDCT, in order to detect atherosclerotic changes and coronary artery stenoses. An intravascular attenuation of 350-400 HU is recommended for coronary CTA (10). Injection parameters for optimum bolus geometry in cardiac CT-angiography (CTA) include an iodine flow rate from 1.2 to 2 g/s.

With decreasing scan time precise bolus timing has become even more crucial. The choice between different iodine concentrations, contrast volumes, several injection phases and flow rates has to be made. The use of a saline chaser is recommended.

After completion of the scan features like different convolution kernels, multi-phase image reconstruction, (automated) detection of motion-artefact-free cardiac phases and different tools for image post-processing including (curved) multiplanar reformations, maximum-intensity projections and volume rendering techniques are available. The introduced automated detection of motion-artefact-free cardiac phases proved to be very helpful and

time-saving in every day reading. Automated segmentation of the coronary artery tree however still requires manual editing and correction and will need further improvement in the future.

Knowledge and understanding of these technical parameters and tools is essential in order to achieve the best possible image quality prevailing solid diagnostic information. Properly applied cardiac MDCT allows for imaging of the coronary arteries with detection and quantification of coronary stenoses including assessment of plaque morphology.

In several studies for all scanner generations the clinical accuracy of cardiac MDCT for the detection and quantification of coronary artery disease (CAD) has been evaluated. Results are continuously improving with values for sensitivity and negative predictive value in the end 90ies. At present the major strength of cardiac MDCT is ruling out relevant coronary artery disease (Fig. 2) rather than precise quantification of coronary artery lumen narrowing. Table 1 gives an overview of 64-slice-MDCT studies comparing CT-angiography to invasive coronary angiography (2, 4, 11-18).

However cardiac MDCT is not only capable of imaging the coronary arteries. Within the same ECG-gated examination an assessment of global cardiac anatomy, stent-patency (or stenosis), bypass-graft condition, anatomical course and size of coronary veins, cardiac valve morphology and left- or right-ventricular function is also possible (19-25). Applying modified or additional scans information on myocardial viability and myocardial perfusion can be obtained as well (26, 27).

Thus, a complete cardiac CT report includes evaluation of all cardiac structures and requires distinct knowledge of cardiac anatomy and pathology. Being able to utilize the options at hand cardiac MDCT offers the potential for a comprehensive examination of the heart in a single breath-hold examination.

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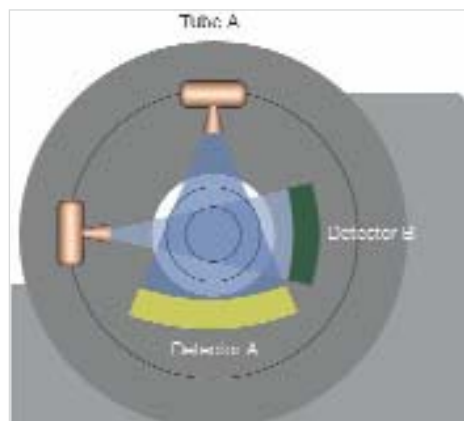


Fig. 1: Scheme of the dual-source computed tomography (DSCT) system with illustration of the acquisition principle using two tubes and two corresponding detectors offset by 90°. A scanner of this type provides temporal resolution equivalent to a quarter of the gantry rotation time, independent of the patient's heart rate.

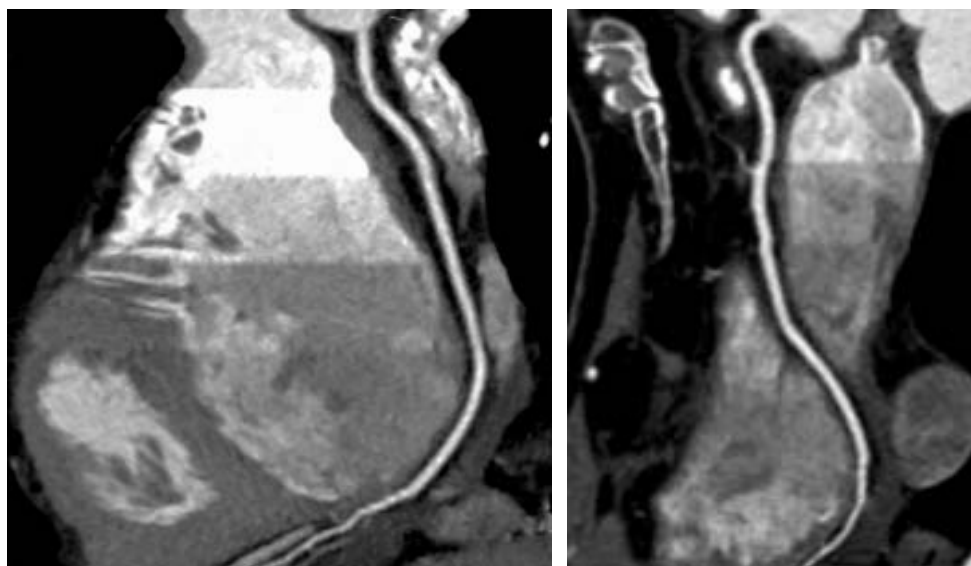


Fig. 2: Contrast-enhanced cardiac CT-angiography in a 62 year-old male patient. The curved multiplanar reformations of the right coronary artery do not show any sign of coronary stenosis.



Matthias Gutberlet
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PET imaging of the heart in comparison to other imaging modalities

Beside the evaluation of cardiac function, the majority of clinical indications for non-invasive cardiac imaging are indications regarding viability and perfusion in patients with known or suspected coronary artery disease (CAD). Different modalities are available for the non-invasive qualitative or quantitative assessment of myocardial perfusion and viability. Thallium or technetium SPECT (single photon emission tomography) are still the most commonly used nuclear medicine techniques to assess myocardial perfusion or viability. The best method to non-invasively quantify myocardial perfusion (1) is PET (positron emission tomography) [using ^{82}Rb , $^{13}\text{N-NH}_3$ or $^{15}\text{O-H}_2\text{O}$], which also used to be the gold standard for myocardial viability assessment using $^{18}\text{F-FDG}$ [^{18}F -fluorodeoxyglucose].

Nevertheless newer techniques like MRI (magnetic resonance imaging), without the disadvantage of radiation exposure or low availability like PET, seem to provide at least comparable results (4, 5).

When it comes to the assessment of cardiac anatomy MRI has to compete with MDCT (multi detector computed tomography), which at the moment has the edge over it in the delineation of the coronary vessels (2, 3). On the other hand MRI facilitates the differential diagnosis of a wide range of cardiomyopathies due to its superiority for tissue characterization. It has also become the modality of choice in the assessment of myocardial viability (4, 5), as it offers better spatial resolution compared to nuclear medicine techniques like SPECT and PET. It also has serious potential to become the modality of choice in the evaluation of myocardial perfusion.

This is of vital importance, as we all want to reduce the number of 'unnecessary' catheter-angiograms (CA). CA is an invasive procedure, which is why its use is clearly undesirable for diagnosis in cases which turn out not to require therapeutic intervention. Reduced perfusion is the first step on the ischemic cascade. Abnormalities in wall motion follow later. Imaging modalities detecting perfusion abnormalities reliably, such as SPECT or PET, therefore have the great advantage that the clinician, at least in theory, can detect the disease at an earlier stage. MRI and with certain limita-

tions stress-echocardiography are useful in assessing myocardial perfusion under stress-induced ischemia, although both these techniques (especially the latter) need further validation (6).

Technetium SPECT, a robust, well standardised technique with a track record spanning more than three decades, is the main competition for MRI. In contrast to MRI straight-forward 'eyeballing' gives reasonable results. Nevertheless false positives due to attenuation caused by the diaphragm, the breasts or adipose tissue in obese patients can be a problem. This can be corrected with the latest technology which may not always be available. Furthermore, the spatial resolution of SPECT is limited and poor compared to MRI. These disadvantages must be added to the risk of radiation exposure, another disadvantage of nuclear medicine.

Nevertheless it must be said that with MRI it can be time-consuming to arrive at even a semi-quantitative assessment of perfusion with a sensitivity and specificity comparable to SPECT. Nor does MRI provide a full, high-resolution coverage of the heart with thin slices or a truly 3D representation at the moment. On the other hand the so-called 'in-plane' resolution

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(the spatial resolution within the slice, not the slice thickness) of MRI is significantly higher than with SPECT. Hopefully it will ultimately be possible to reduce acquisition time and overcome these limitations with higher field strengths (3.0 Tesla) which yield a higher 'signal-to-noise' ratio, combined with parallel imaging strategies that have high-acceleration factors.

Cardiac MRI is not actually as far off the desired 'one-stop-shop' as you might think from this exploration of the pros and cons. The technical advances discussed above (higher field strengths and parallel imaging) will also help to improve the visualization of the coronaries. Nevertheless, to challenge the 3D/4D (three spatial dimensions plus one temporal) capabilities of MDCT in imaging the whole heart in a single breath-hold, which is obtainable with isotropic submillimeter voxels, may require not only higher field strengths and parallel imaging, but also improved coil design and maybe the additional use of contrast agents. New contrast agents might also make the absolute quantification of myocardial blood flow with MRI a possibility. Although in terms of clinical practice this is probably not essential (it is currently only carried out in specialised centres as a research tool using special forms of PET), it might move this tool from benchmark to bedside.

There is still an urgent need for large multicentre trials, like those carried out for nuclear medicine and echocardiography, to assess the role of MRI as a non-invasive technique for risk stratification in, for example, diabetic patients.

Taking the above mentioned limitations into account, integrated imaging (Fig. 1) of PET/SPECT perfusion images with the morphologic visualization of the coronary arteries by MDCT may be a short-term solution (2, 3). With the success of MDCT to reliably visualize the coronary arteries, this approach becomes more and more popular and leads to a renaissance of cardiac PET not only in a scientific environment, but also in clinical routine (3).

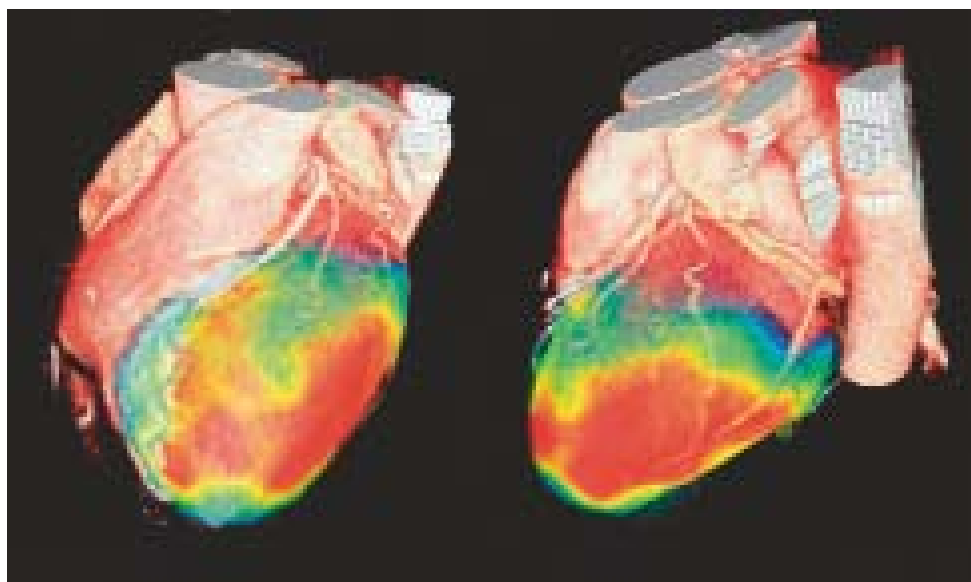


Fig. 1: Integrated imaging allows comprehensive evaluation of coronary anatomy and perfusion. This stress myocardial perfusion imaging by SPECT is fused to a 64-slice CT. No abnormality is shown (courtesy by Prof. Dr. Philipp Kaufmann, University Hospital Zürich).

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Advertorial

Prospective randomized clinical trial comparing conventional TACE with Doxorubicin -loaded HepaSphere in Hepatocellular Carcinoma



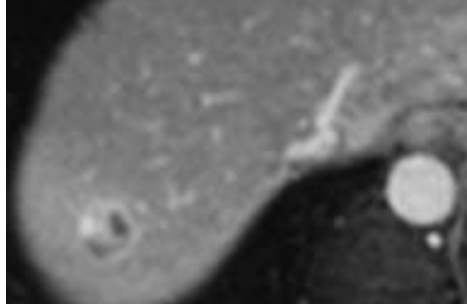
An Interview with
Doctor Geert Maleux
Department of Radiology –
University Hospitals Gasthuisberg – Leuven -
Belgium

Doctor Maleux, you are conducting a randomized clinical trial on the treatment for Hepato-Cellular Carcinoma. What are the objectives of this trial?

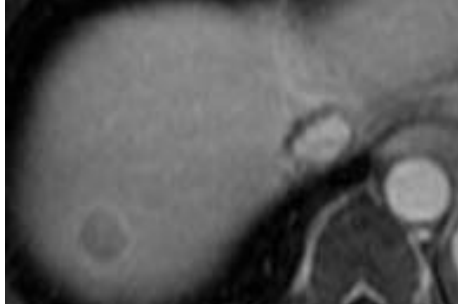
In this randomized clinical trial we are comparing conventional Trans Arterial Chemo-embolization (TACE) vs. Doxorubicin loaded HepaSphere for patients with Hepatocellular Carcinoma (HCC). One of the objectives is to compare the level of systemic recirculation of the drug in both groups and evaluate the subsequent drug-related side effects. Additionally we are evaluating tumour response by utilizing MR perfusion imaging as well as changes in alpha foeto protein level. The ultimate goal of this study is to evaluate benefits in terms of survival.

What is the design of this study?

Our prospective RCT will compare two different types of transcatheter chemoembolization for the treatment of patients with unresectable HCC. A total of sixty patients will be included in



the study and randomized in two groups. One group is treated by conventional TACE, using Doxorubicin, Lipiodol and EmboSSsphere 300-500 mm. The second group is treated using Doxorubicin-loaded HepaSphere 50-100 mm. In both groups, embolization is performed until disappearance of tumoral blush is reached. The dose of drug is calculated based on the patients' body surface area with a dose of 50mg/m²; this dose is weighed according to bilirubin level. Side effects, i.e. drug-related side effects, and post-embolization syndrome are recorded; imaging follow-up will be performed up to 12 months in order to evaluate long-term tumour response. Local tumour response is measured using MR perfusion imaging. Biological parameters, such as alpha-foeto protein, will also be measured to help demonstrate tumour response. Additionally, more specific is conducted on ten patients in each group. We measure the serum level of Doxorubicin at 7 seven different points in time points, up to 3 three hours after the embolization, in order to evaluate the systemic release kinetic of the drug. The objective is to demonstrate that Doxorubicin-loaded



HepaSphere has a greater ability to downsize the level of system doxorubicin concentration and additionally a higher greater ability to maintain a high concentration of drug on at the embolization site versus conventional TACE.

What are the early preliminary results?

At the moment, we have treated ten patients, six patients with conventional TACE and four patients with doxorubicin-loaded HepaSphere. No deaths have been observed on occurred within this group. Systemic drug levels have been measured on three patients in each group. Results are depicted on the graphic and demonstrate that the circulating drug level is much lower in the Doxorubicin-loaded group as compared to the conventional TACE group. Post-embolization syndrome appears to be much lower in the Doxorubicin-loaded group; patients in this group benefit from an overnight hospitalization as compared to the two to three days hospitalization for patients in the conventional TACE group. Additionally, all patients in the conventional TACE group



presented with some hair loss, no such side effect has been observed in the Doxorubicin-loaded HepaSphere group. Although imaging follow-up is too premature to establish any definitive conclusions is still short to reach any conclusion, no progressive disease has been observed in either group. See These images show pre-embolization MRI before and 1 and 6 months MRI after embolization with Doxorubicin-loaded HepaSphere.

What is your opinion regarding the utilization of embolics that can also be used as drug vector in the treatment of HCC?

Mixing HepaSphere with Doxorubicin is performed by our pharmacy department. The preparation is easy and fast enough to be prepared one hour before the procedure is conducted. We have found the product to be easy to handle and inject. Considering the early results in terms of a lower level of systemic circulating drug, low reduced post-embolization syndrome and other side effects, like such as the absence of hair loss in the Doxorubicin-loaded HepaSphere group, we are very enthusiastic and believe longer term results

Advertorial

Teaching vertebroplasty to the next generation of clinicians



Dr. Salvatore Masala
University of Rome Tor Vergata
Department of Radiology



Radiofrequency and VTP with Cardinal Health cement

As vertebroplasty continues to become a more common procedure for treatment of osteoporotic compression fractures, Cardinal Health has responded with new tools to meet evolving clinical needs. The AVAtex® Advanced Vertebral Augmentation System from Cardinal Health brings together a clinically-focused, modular vertebroplasty system that is simple enough for first-time users, yet sophisticated enough to handle the more complex cases often performed by veteran practitioners. One such expert, Dr. Salvatore Masala of the University of Rome Tor Vergata Department of Radiology, has performed vertebroplasty procedures on over 1,300 levels in more than 650 patients since his first case in 2001. In 2004, he began offering courses to instruct other physicians in vertebroplasty and has become a

noted trainer, devoted to teaching the next generation of physicians how to perform vertebral augmentation procedures.

Dr. Masala uses the AVAtex Vertebral Augmentation System from Cardinal Health. This system was conceived to facilitate image-guided, minimally invasive treatment of osteoporotic compression fractures and fractures caused by destructive vertebral lesions. By focusing on clinician needs during the initial design phase, this system from Cardinal Health now boasts a number of unique features designed to enhance the user's clinical experience.

Maximum procedural flexibility

Dr. Masala appreciates the AVAtex Advanced Vertebral Augmentation System's maximum procedural flexibility. He noted, "It is evident that the AVAtex system was designed around the needs of clinicians. Because Cardinal Health offers a wide range of components for vertebroplasty, the clinician can easily choose the appropriate components to meet each patient's needs."

Modular system for convenience and economics

This proven system was designed to be modular, offering flexibility to meet a number of different user preferences. For example, the clinician can begin with a single AVAtex procedure tray and add only necessary components to customize the system to the case at hand. These modular components include key conveniences such as separate cement and supplemental barrel/tubing kits that allow reusability of a single injector. Access cannulas are included in the trays or sold separately in a full range of stylet configurations including trocar and bevel stylets. Matched bevel tips are also avail-

able and provide directional cement control while facilitating access in narrow passages.

New coaxial biopsy system

To meet additional clinical needs, Cardinal Health recently released a new AVAmax coaxial biopsy system that offers physicians the benefit of performing tissue sampling through the primary injection needle.

Suitable for both new and experienced users

While Dr. Masala has been doing the procedure for a number of years, he feels that the AVAtex system is also ideal for beginning practitioners. In fact, Dr. Masala uses the AVAtex system in the one-day workshops he leads to train physicians who are new to vertebroplasty.

The classes offer hands-on opportunities to develop and practice techniques in a small group format. He also leads a limited number of one-on-one classes for physicians desiring a more intensive introduction or advanced review of vertebroplasty.

Beyond its ease-of-use for the new user, the AVAtex system is excellent for more experienced clinicians as well. In fact, Dr. Masala commented favourably on the flexibility of Cardinal Health's offering, stating, "I use the 13 gauge AVAtex system for vertebroplasty procedures following RF ablation and cryoablation therapy."

Unique bone cement stands out

Dr. Masala also appreciates the unique AVAtex bone cement offered by Cardinal Health. He commented, "I like how the AVAtex bone cement is ideal for both new users and experienced users." He explained that the cement's long working time allows a consistent mixing result with plenty of time to complete either a first-time vertebroplasty procedure or the more complex cases often performed by veteran practitioners.

He added, "The cement's consistency is also important. I am so comfortable with the mixing process that I prefer to quickly mix it on my own. For new physicians, they generally appreciate the simple and consistent results of the AVAtex mixing components and process and it facilitates their initial use of the system. It also allows a technician to mix the cement while the physician secures placement if desired; this can be an efficient option for clinicians to approach this procedure."

The cement also distinguishes itself with a high level of visibility produced through a unique formulation of multiple-size barium sulfate particles. This formulation creates a dual-imaging matrix that specifically aids tracking of bone cement placement and flow under fluoroscopy during the repair of spinal fractures and could be predictive of undesirable venous leak. Dr. Masala appreciates this visibility, stating, "Because of the high level of visibility and the control offered by the injector, I feel more confident about my ability to help manage proper cement placement."

For more information on the AVAtex Advanced Vertebral Augmentation System and the new line of AVAmax accessories, visit the Cardinal Health Booth #64 on the lower level of CIRSE. More detailed information about Dr. Masala's training courses will also be available at the Cardinal Health booth.

Dr. Masala is a noted Interventional Radiologist, vertebroplasty trainer and paid consultant for Cardinal Health in the area of vertebroplasty.

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Despite organisational and logistic improvements in clinical support by introducing dedicated stroke centres, stroke is still an important event leading to high mortality and morbidity, requiring major financial resources in acute care, rehabilitation and day-to-day support in the follow-up period.

In our hospital we treat about 1,000 cases of stroke per year with 800 cases directly supervised by our dedicated stroke unit. Among those 1,000 cases, around 250 undergo thrombolytic therapy, but of course the vast majority will require intravenous application of thrombolytic agents while interventional methods remain reserved for about 20% of patients undergoing thrombolysis.

Indications for interventional management

There is an ongoing discussion when and how interventional management should be introduced in the treatment of stroke patients. It mainly depends on the close cooperation of neurologists and radiologists to optimize the logistics of the intervention, timing, quality and indications. There are several accepted indications for interventional management of stroke. They include

- vertebrobasilary artery occlusion,
- proximal occlusion of the middle cerebral artery in the M1 segment and
- occlusion of the distal carotid artery (carotid t-occlusion).

These patients usually have a desperate prognosis and require immediate recanalization for survival.

There is some discussion whether patients with M2 occlusion who are out of the time window of 3 hours are also candidates for intra-arterial thrombolysis via catheter delivery. In our institution we also treat patients and massive stroke with acute occlusion of the proximal carotid artery by stent implantation combined with intra-arterial thrombolysis, as it is known that recanalization by iv lysis is very unlikely in those cases. Immediate and intra-arterial techniques are used in patients who experience stroke complications from endovascular procedures such as carotid artery stenting or aneurysm coiling.

Technique

The techniques of intra-arterial thrombolysis are pretty straight forward. After placing a suitable guiding catheter into the ipsilateral internal carotid artery – if possible – a micro catheter is guided into the carotid T or the M1 segment, the occlusion is probed by the guide wire and/or the catheter in order to test whether there is an underlying stenotic lesion and to allow deployment of lytic agents within the thrombus. It is sometimes helpful to perform some mechanical irritation of the clot in order to enlarge the thrombus surface which is prone to thrombolysis and to achieve some fragmentation.

Usually amounts of 10 to 30 mg of rtPA are delivered intra-arterially. More and more often, mechanical thrombectomy systems allowing suction or mechanical retrieval of clots either in total or in part are used, such as the MERCI-sys-

Interventional management of stroke

tem, the Penumbra system or others. In some cases balloons of 1.5 to 2.5 mm in diameter are used either to open an underlying stenosis or to fragment the thrombus. In case of proximal carotid artery occlusions we usually perform primary stenting of the occlusion with no or careful subsequent ballooning which is followed by intracranial lysis if necessary.

Perinterventional treatment

Patients with massive stroke are frequently agitated and difficult to handle. It is always important not to lose too much time by handling a non-cooperative patient and deep sedation and intubation should be planned in time. This requires good cooperation with the anesthesiologist.

There are more and more discussions about alternative protocols in order to protect the brain and to improve results both from iv and ia thrombolysis. Some of these protocols use a bridging technique starting with iv application of platelet inhibiting agents such as abciximab or tirofiban and followed by iv or ia application of rtPA. To minimize coagulation problems, it is of utmost importance not to heparinize these patients. Postinterventional exclusion of intracranial haemorrhage by CT and follow-up care in an intensive care unit is required.

Results

Patients who are candidates for interventional management of stroke are poor candidates with regard to survival and outcome. The natural course of ICA occlusion associated with acute stroke is desperate. Meves et al found 20 patients with acute ICA occlusions and stroke. While 6 of these patients (30%) showed spontaneous recanalization, only 2 (10%) showed clinical improvement after spontaneous recanalization (1).

Tandem obstruction of both the internal carotid artery and the middle cerebral artery however are frequently highly symptomatic with a good outcome (mRankin Scale ≤ 2) in only 30% (2) despite intravenous thrombolysis. While in isolated MCA occlusions iv thrombolysis is successful in recanalizing the obstruction in 39%, this was observed in only 9% of patients with tandem lesions. After carotid T obstruction, the outcome is even poorer with a mRankin score ≤ 2 in only 17% (3).

Linfante and co-workers found a recanalization rate of 31 % in patients with ICA occlusions compared to 88% in patients with MCA occlusions and iv thrombolysis (4). Carotid artery occlusions usually do not react well to intravenous thrombolysis: Christou et al. (5) found no recanalization in 74% of those patients along with intravenous thrombolysis. Complete or partial recanalization of the central cerebral vasculature is however positively related to the final outcome (4).

Even with intra-arterial lysis, distal ICA occlusions are known to have a lower recanalization rate compared to MCA occlusions (6, 7). Combined IV/ IA therapy seems to improve prognosis also in distal ICA occlusions compared to sole IA fibrinolysis (8). The IMS investigators reported on 5 cases among 79 with combined iv and ia lysis and proximal carotid artery occlusions. They reported on a TIMI 2-3 recanalization in only one patient, a mRankin score ≤ 2 in 2 patients and a mortality in 2 (40%) (9).

In November 2005 Jovin et al. reported on 15 patients with acute stroke or fluctuating neurological symptoms who underwent stent implantation into the proximal internal carotid artery (10). Two out of 15 patients died and at 30 days, a mRS ≤ 2 were found in 6/15 patients (40%). The early outcome is therefore comparable to the outcome in our group. However it must be stressed that long-term follow-up showed an additional clinical improvement in our patients.

In December 2005 Nedeltchev et al (11) reported on 25 patients with acute stroke and acute occlusion of the proximal carotid artery which were treated with pharmacomechanical lysis and stent implantation into the internal carotid artery between 1997 and 2003. They were compared with a group of patients (n=31) who received heparinization and antiplatelet medication, but no recanalization of the carotid artery had been attempted. In the stent group 5/25 (20%) patients died, as did 5/31 patients in the medical group (16%). They found a favourable outcome (mRankin score ≤ 2) in 14/25 patients in the stent group (56%) and in only 26% in the medical group.

Only few data exist on the combined use of GPIIb/IIIa-receptor-antagonists and rt-PA in acute stroke (12). Morris reported on five patients who received half dose of tissue plasminogen activator and abciximab (13). In AbESTT it was shown that the administration of abciximab for acute stroke treatment had no increased bleeding risk and a tendency for a better outcome.

Haerten et al. showed similar results for the sole use of tirofiban in 18 patients (14). Seitz and co-workers found that treatment with rt-PA and tirofiban resulted in a 50% lesion reduction in T2 weighted magnetic resonance imaging on day 8, while lesion reduction was less in the rt-PA group and absent in nontreated patients (15). Straub et al. treated 19 patients suffering from acute middle cerebral artery occlusion combined with rt-PA and tirofiban and found a 68% recanalisation without an increase of intracerebral bleeding (16).

In our own experience, we treated eighty-one patients (65 ± 11.9 y) with GPA combined with intra-arterial pharmacomechanical thrombolysis, 30 tandem occlusions of ICA-MCA, 25 MCA occlusions and 26 BA occlusions were included. The mean NIHSS at admission was 16.6 (=mean modified Rankin scale (mRS)=4.7). Intracerebral haemorrhage (ICH) was excluded by CCT. Patients were bridged either with abciximab (39) or tirofiban (42) followed by pharmacomechanical thrombolysis with rt-PA.

In these patients, mean mRS at discharge was 2.9 and 1.8 after rehabilitation. Twenty six patients (31%) showed an ICH in the control CCT, 11 (14%) of those being symptomatic. Eight of these 11 patients showed malignant infarction due to failed recanalisation. Two patients died due to perforation of the BA, one died from pulmonary embolism. After rehabilitation, 38% showed a modified Rankin score of 0 to 2 (excellent-good) and 15% a mRankin score of 3 (moderate).

Don't miss it!

Management of acute stroke

Special Session SS 2901

Wednesday, September 12, 10:00-11:00
Room C (Skalkota Hall)

Conclusion

Interventional management of stroke is performed in a small subset of the general stroke population. This group, however, is growing and interventions are more and more requested by neurologists. The methods are able to dramatically improve the outcome in patients with an otherwise desperate prognosis. New ways including mechanical clot removal are under evaluation in order to speed up the process of recanalization, as time is the key factor to achieve a good outcome in these patients. Therefore, interventional stroke management should become available in all institutions running stroke centres and not only neuroradiologists, but also all Interventional Radiologists should become familiar with these techniques in order to offer a wide-spread service in time.

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Record high in abstract submission for CIRSE 2007



Michael Lee
Chairman Scientific Programme Committee
Professor at the Department of Radiology
Beaumont Hospital
Dublin, Ireland

CIRSE is proud to announce that 1038 abstracts were submitted for CIRSE 2007, surpassing last year's benchmark by a whopping 16%. Submissions on the topic of Embolotherapy increased by more than 33%, replacing Peripheral PTA and Vascular Stents as the most popular topic.

Abdominal and GI Tract Intervention followed by tumour ablation and Other Oncologic Interventions saw the strongest increase in submissions. In line with CIRSE's focus on clinical practice development, abstracts on this topic more than doubled since 2006.

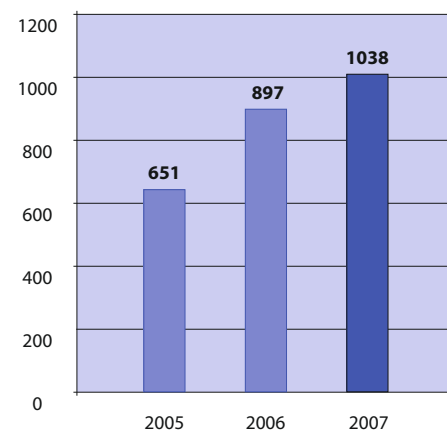
Fibroid Intervention, Pediatric IR, Neuro Interventions, Radiation Safety and Molecular Imaging in IR, which were not given a dedicated abstract category last year, saw a submission of 76 papers altogether.

CIRSE would like to thank all doctors who have submitted abstracts for CIRSE 2007.

More than **1,000 papers**

submitted to the number one platform for Interventional Radiologists in Europe

Submission Figures 2005 - 2007



Submissions per primary topic

Main topic	2006	2007
Embolotherapy	99	126
Peripheral PTA and vascular stents	102	107
Aortic stent graft	61	65
Abdominal and GI tract intervention	46	63
Others	67	58
Vascular imaging and diagnosis	46	55
Bone and soft tissue intervention	44	55
Tumor ablation	42	54
Venous intervention	54	54
Hepato-biliary intervention	45	48
Experimental work in IR	47	46
Carotid artery imaging and intervention	39	43
Genitourinary intervention	43	35
Other oncologic intervention	25	33
Fibroids intervention	-	32
Haemodialysis shunts and venous access	43	31
Renal artery intervention	23	26
TIPS and portal vein intervention	35	23
Neuro interventions	-	21
Clinical practice development	7	18
Cardiac imaging	19	15
Pediatric IR	-	14
Radiation safety	-	8
Central nervous system intervention	10	7
Molecular imaging in IR	-	1
Total	897	1038

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Dear Colleagues,



Gao-Jun Teng



Ke Xu

It is a great honor to be invited to the "CIRSE meets..." session. On behalf of the Chinese Society of Interventional Radiology (CSIR), we would like to express our gratitude to Prof. Lammer and Prof. Adam for their efforts to make this event possible. We would also like to thank all members of CIRSE and the CSIR who are involved in this session.

With more than 3,000 members, the CSIR is one of the world's largest societies for Interventional Radiology. Nevertheless compared to other societies such as CIRSE, the CSIR is a relatively young society. We realise that it is very important to learn from and cooperate with other societies, which is why we are extremely happy to have a friend and partner in CIRSE.

Of course friendship starts with familiarising yourself with each other. We would therefore like to introduce our society to you. Interventional Radiology in China started in the 1980ies with the "Open and Reform Policy" of our country. Due to the rapid increase of IR procedures, the CSIR was founded in 1990. In our opinion IR has been one of



the most promising new sub-specialties in clinical medicine since the 1990ies. This may be one of the reasons why IR seems much more popularised and well developed in China than in other developing countries.

As the Chinese economy is sky-rocketing, numerous state-of-art tools, including flat panel detector C-arm digital angiography units and CT- angiography equipment have been installed in many hospitals. There are about 1,000 to 1,500 C-arm DSA units in the country. We perform numerous procedures which cover every aspect of IR, such as chemoembolization for hepatoma, carotid arterial stenting, stent-graft for aortic disease, etc.

The specific status of IR in China is that full clinical care and the management system are becoming more and more popular. The system includes a self-referred unit (outpatient clinic) and inpatient wards dedicated to IR patients. The entire system is taken care of by Interventional Radiologists. Research in IR is also a very active area in China; there are numerous research programmes carried out by Interventional Radiologists and researchers.

The grants sponsoring such projects origin from various sources, including funds from the central government, local governments and other resources. With grants from institutions such as the National Natural Science Foundation of China (NSFC), Interventional Radiologists are involved in many state-of-the-art research projects on topics like stem cell transplantation, biological target therapies (e.g. gene therapy and angiogenesis therapy on tumors via interventional procedures) and applications of molecular imaging techniques in IR.

The biggest problem IR in China faces today is the same as that faced by interventionists in Europe: protecting our discipline against other specialties. Originally, IR procedures in China were performed almost entirely by Interventional Radiologists. However, many other specialists such as cardiologists, vascular surgeons, neurosurgeons and even neurologists are currently involved in these procedures, resulting in a smaller proportion of IR procedures being performed by interventional radiologists. Fortunately our society is still the largest community of Interventions in China.

Don't miss it!

CIRSE Meets China Josef Roesch Lecture

Tuesday, September 11, 13:00-14:00
Room A (Trianti Hall)

Today we have arrived at the same crossroads as our friends in the western hemisphere, although IR started 20 year later in China. There are a lot different paths to choose from, but we believe that we have chosen the right way to confront this problem: we have decided to become real clinicians. It is not a new idea to establish an inpatient ward dedicated to Interventional Radiology only. However, it has not been widely established in the western hemisphere due to many roadblocks, such as lacking monetary remuneration (as in the United States). By contrast, this inpatient care system for IR has been popularised in China.

Another important issue is whether IR should separate from diagnostic radiology or not. A survey carried out in the Jiangsu province shows that 24% of IR departments have been separated from the diagnostic radiology units. Currently, we do not encourage all IR departments to be separated from diagnostic radiology, as a unity of IR and diagnostic imaging is important for enhancing the power of the two subspecialties. Nevertheless, it is an option to establish an independent department if IR is not well respected within the radiological department.

No matter how the future of Interventional Radiology will be, we believe that we should do our best for it. To share and exchange our knowledge and philosophy is important for both our societies. Therefore, on behalf of the Chinese Society of Interventional Radiology, we would once again like to express our gratitude to CIRSE for this opportunity.

We look forward to seeing you at the "CIRSE Meets China" session.

Ke Xu

Professor and President of the
Chinese Society of Interventional Radiology

Gao-Jun Teng

Co-Chairman, CIRSE Meets China
Professor and Vice President of the
Chinese Society of Interventional Radiology



Krassi Ivancev
CIRSE 2007 Roesch Lecturer

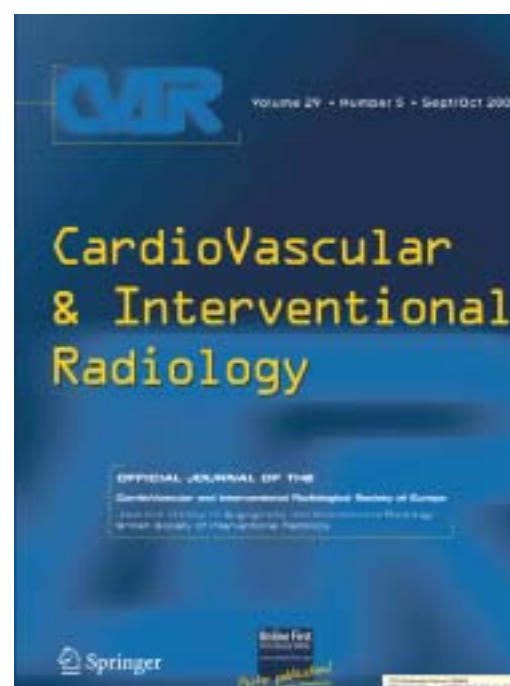
Josef Roesch Lecture

The CIRSE Roesch Lecture was founded in 2003 to honour Professor Josef Rösch, whose award-winning research work spans more than 50 years, covering a wide range of Vascular and Interventional Radiology. Two of his most notable achievements are the development of the TIPS technique in 1969 and the introduction of embolization into the treatment of gastrointestinal bleeding in 1971. To this day, Professor Rösch continues to work on the development of new techniques and devices for interventional treatment.

This year's Roesch Lecture will be given one of the pioneers of stent-graft treatment of abdominal aortic aneurysms; Professor Krassi Ivancev. The chairman of the Endovascular Centre at Malmo University will speak about "Endovascular aneurysm repair: current and future status".

We invite all of you to attend this outstanding lecture which will take place from 13:00 to 14:30 in Room A (Trianti Hall).

Cardiovascular and Interventional Radiology (CVIR)



Keep up to date with the latest developments in Interventional Radiology with CVIR, the official CIRSE Journal. Published on a bimonthly basis, CVIR offers the latest articles on research, clinical practice and other hot topics related to IR. A subscription to CVIR as well as access to its online version offering the possibility to browse all previously published articles and search for specific topics is free of charge to all CIRSE Members. If you are interested in becoming a CIRSE Member, please visit us at the CIRSE booth or e-mail us at info@cirse.org.

Advertorial



Thierry de Baere
Institut Gustave Roussy – Villejuif - France

Radiofrequency (RF) ablation has achieved impressive results in the treatment of unresectable primary and metastatic liver cancer. Today RF ablation of primary and metastatic lung tumor is increasingly used and preliminary results are encouraging. In the experience of the Institut Gustave Roussy and Institut Bergonié, **complete ablation of lung tumor can be obtained in as high as 93% [IC95% = 86-97]** of tumors, either primary or metastasis (Radiology. 2006 ; 240 : 587-96). Complete ablation rate is even higher when the tumor is smaller than 2 cm. When tumors are between 2 and 4 cm, complete ablation can be achieved in 80 to 90% of the cases. Over sizing the volume of ablation in order to obtain ground glass opacity twice as large and twice as long as the tumor will significantly increase the rate of complete ablation.

CT has been used as the standard technique for follow-up of liver tumor after RF ablation and provides sensitive, specific and relative early detection of incomplete ablation. In the lung, because it is difficult to depict enhancing tumors, detection of local tumor progression

Radiofrequency Ablation of Lung Tumors: Where do we stand? Where do we go?

on CT follow-up is mostly based on increase in size of the treated area, which is often of late occurrence, usually later than 6 months. Functional imaging and namely PET-CT is very promising and was able in our unpublished experience to depict 75% of incomplete ablation before 3 months while in our previous experience with CT follow-up, 80% of incomplete treatment were depicted 6 months after treatment or later.

The major question about every cancer therapy, and consequently about radiofrequency ablation of lung tumor, is how treatment impacts on survival. Even though these data are preliminary results*, (which will be presented at CIRSE 2007 Free Paper Session: "Tumor Ablation: Lung & Renal" on Wednesday September 12, 11.30–12.30, Room D), it seems to show an equivalent survival after RF ablation that after surgery for lung metastases, with 2 and 3 years survival rates close to 70% and 50% respectively. We have to underline that in our experience RF ablation has always been performed with a curative intent which means that patients were treated only if all lung disease depicted during pre-RF imaging work-up, can be ablated, with sometimes the need for additional RF or surgical resection for extra-pulmonary disease. PET-CT was extremely useful in this work-up and changed the therapeutic strategy in 31% of patients by canceling RF in 14% due to not ablatable or resectable tumors, by indicating the need for additional locations of ablation in 11% and by indicating the need for additional surgery in 6%. There is no proof

of the benefit of RF in palliative intent either with incomplete ablation of a given tumor or ablation of some of the tumors, but this field needs to be explored in the future. Indeed, the value of RFA combined with systemic chemotherapy versus chemotherapy alone in the palliative treatment of liver metastases will be soon evaluated in a worldwide randomized multicentric trial (Prometheus study).

In the future, development of RF ablation for lung tumors will need large scale datas to demonstrate evidence based excellent local efficacy, low morbi-mortality, and survival of patient close to surgery. Randomized trial would be the perfect study design but we learnt from past experience that it is difficult to enroll patient when they have to be randomized between two very different techniques of treatment. Consequently, large scale registries with homogeneous data will help to define best candidates for RF through identification of prognostic factors of success and survival for lung radiofrequency. At last diffusion of the technique will not be possible without adequate sources of funding from social & medical insurances and we have to start negotiating with national & private bodies that apply different rules in each of the European countries.

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*Please visit the Boston Scientific Booth on the entrance level and ask for a Lung Ablation dossier



Fig 1 : CT obtained during radiofrequency ablation of right lower lobe metastases where a 5.0 cm LeVeen™ Needle Electrode is seen opened in the target tumor.



Fig 2 : CT obtained 3 days after ablation demonstrated cavitation of the tumor mass, ground glass opacity on the ablated area and subcutaneous emphysema. Subcutaneous emphysema will resolve spontaneously after 15 days.

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Robert Morgan
Consultant Vascular and Interventional Radiologist
Honorary Senior Lecturer
St George's NHS trust and medical School
London, UK

Stents in the SFA: What do the trials tell us?

When metallic stents were introduced into clinical practice in the early nineties, many interventionalists proclaimed their arrival as the solution to the modest results of PTA in the superficial femoral artery (SFA), with 1, 3 and 5 year primary patency rates of 61%, 51% and 48%, respectively.

Unfortunately, the results of cohort studies of early SFA stents did not show any noticeable improvement compared to PTA with 1 year and 3 year primary patency rates of 67% and 58%. Moreover, five randomised trials which compared stents with PTA failed to show a benefit for stents compared with PTA. Since these disappointing data, the use of stents in the SFA has largely been confined to salvage of failed PTA by the majority of Interventional Radiologists.

The main reason for the poor durability of stents has been recurrent stenosis caused by neointimal hyperplasia. Therefore, after the early stent trials, interest focussed on ways to prolong the durability of stents by a variety of measures including the use of irradiated stents, coated stents and covered stents. In general,

data from the studies on irradiated stents has not shown any convincing benefit for these stents to counteract the drawbacks of these devices. Similarly, although some of the data from studies involving covered stents has been more favourable than PTA, the drawbacks of the high costs of the devices and their large calibre delivery systems outweigh the benefits and the restenosis and occlusion rates are still unacceptable.

Most interest has centred on the concept of drug-eluting stents (DES). The majority of research in this area has involved the drugs Sirolimus and Paclitaxel. Several large trials investigating DES in the coronary circulation have found that DES have significantly lower restenosis rates than bare metallic stents. The SIROCCO trials compared uncoated self-expanding Smart stents (Cordis) with stents coated with Sirolimus. The phase 1 trial randomised 36 patients to either coated stents or uncoated stents and was published in 2003. At 6 months, there was zero restenosis in the Sirolimus group compared with 23.5% restenosis in the uncoated stent group. The SIROCCO II trial involved 57 patients, but found no significant difference between the restenosis rates of the coated and uncoated stent groups at either 6 months or 2 years. These data led most workers to conclude that there was no perceived advantage for Sirolimus coated stents in the peripheral arteries.

An interesting finding from the SIROCCO data was the impressive primary patency of the bare stent group, with a restenosis rate of only 21.1% at 24 months, which is substantially better than the patency rates of the first genera-

tion stainless steel stents (Palmaz, Wallstent). Indeed the improved patency rates of the nitinol stents in the SIROCCO trials have been repeated in other studies involving the Smart stent and other nitinol stents. These improved results for stents in the SFA have prompted several prospective randomised studies comparing nitinol stents with PTA. Some of these trials are now publishing their early results.

In the ABSOLUTE study the restenosis rates for the stent group were 24% and 37% at 6 and 12m follow-up compared with 43% and 63% in the PTA group. Thus the restenosis rates were significantly lower in the stent group compared to the PTA group. In the RESILIENT study, at six months, the primary patency was 41.2% in the PTA group and 89.7% in the stent group. The 12 month interim results showed a freedom from intervention rate of 44.1% for the PTA arm and 81.5% in the stent group, and a clinical patency rate in the stent group of 80%. Other trials in process include the ZILVER PTX drug-eluting stent trial, which evaluates the Cook ZILVER stent (W. Cook, Bjæverskov, Denmark) coated with Paclitaxel in the SFA.

While the data from the ABSOLUTE and RESILIENT trials are encouraging in terms of stenting vs. PTA in the femoropopliteal segment, the recent results are not uniformly in favour of stents. Early results of the FAST trial comparing the Luminex stent (Bard Angiomed, Karlsruhe, Germany) with PTA show no benefit for the stent arm.

One of the concerns with SFA stents is the fracture rate, particularly of long stented segments. Fractures were first noted in the SIROCCO 1

Don't miss it!

**Thoracic stent grafting:
Which patients, which stents,
which technique**
Workshop 2605

Tuesday, September 11, 16:15-17:15
Room H

study which reported a fracture rate of 18.2%. These results were repeated by Sabeti et al who reported stent fractures in 15% of stents. This group commented that the fracture rate seemed to be related to the length of the stented segment. Scheinert et al reported stent fractures in 37.2%, and also found a relationship with increasing stented segment length. However, the RESILIENT group and the phase I ZILVER PTX data have reported a substantially lower fracture rate with a fracture rate per stent of 3.7% and 0% respectively at 12 months.

In summary, there is evidence from two prospective randomised trials which indicates that the 12 month patency rates of the Lifestent and the Absolute stent are better than balloon angioplasty in the SFA. These data agree with similar favourable results from the SIROCCO studies and other cohort series of nitinol stents in the SFA. The FAST trial data suggests that there may be a difference in the outcomes between different types of nitinol stents in the femoropopliteal segment. Finally, whether stent fractures are a common problem or not requires more evaluation.

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Foundation Party

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Tuesday, September 11, 2007

The CIRSE Foundation Party is doubtlessly CIRSE's most popular social event, which is why CIRSE will kick it up a notch this year, adding even more performances and surprises to this fun and exciting evening. The exquisite dinner followed by a spectacular show will give you the opportunity to support the Foundation's activities while networking with interventionists from around the globe.

To purchase tickets or pick up previously booked tickets, please go to the Hotels, Tours & Social Events Counter in the registration area.



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